

# Mobile Greenhouse Gas Flux Analyzer for Unmanned Aerial Vehicles, Phase II

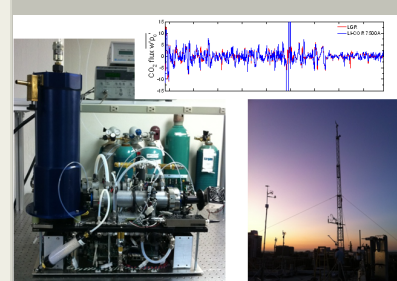
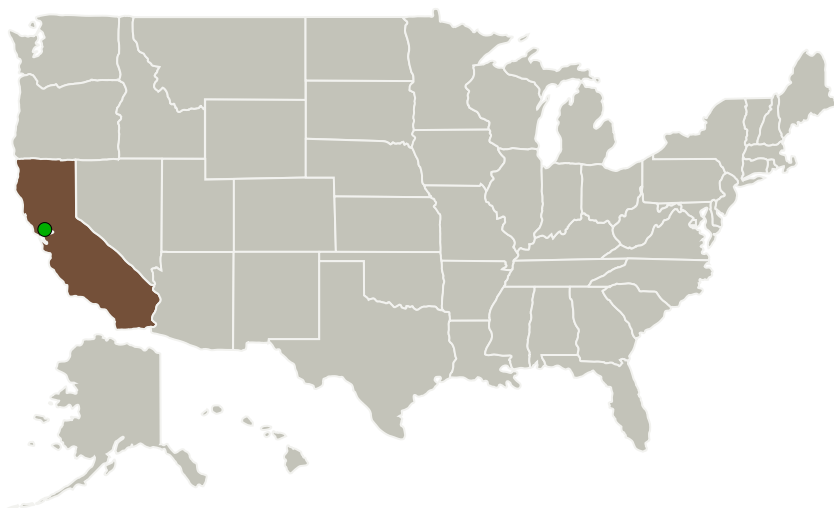
Completed Technology Project (2012 - 2016)



## Project Introduction

Los Gatos Research (LGR) proposes to develop highly-accurate, lightweight, low-power gas analyzers for measurements of carbon dioxide (CO<sub>2</sub>) and water vapor (H<sub>2</sub>O) aboard NASA's Sensor Integrated Environmental Remote Research Aircraft (SIERRA) unmanned aerial system (UAS). These analyzers, which will exploit both conventional mid and near-infrared tunable diode laser spectrometry and LGR's patented Off-Axis ICOS technology, will be capable of meeting the stringent weight, power, and environmental requirements for UAS deployments. At the conclusion of the Phase II effort, LGR will deliver and deploy two complete systems. The first analyzer will make extremely rapid (> 20 Hz) airborne eddy flux covariance measurements of CO<sub>2</sub> and H<sub>2</sub>O. The second instrument will measure CO<sub>2</sub> isotopes aboard SIERRA, allowing a better understanding of the chemistry, transport, and exchange of carbon between the atmosphere, anthropogenic sources, and natural carbon sinks and sources in the terrestrial biosphere. Airborne measurements enable regional-scale investigations of carbon sources and sinks as well as measurements where conventional tower flux deployments are infeasible. These data will complement current satellite observations by providing higher horizontal resolution and vertical profiling, enabling better quantification of carbon sources and sinks. Such deployments are critically important to NASA's Earth Science Division, because they enable more efficient and cost-effective Earth observations.

## Primary U.S. Work Locations and Key Partners



Mobile Greenhouse Gas Flux Analyzer for Unmanned Aerial Vehicles, Phase II

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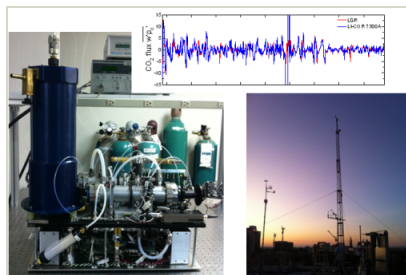


Organizations Performing Work	Role	Type	Location
Los Gatos Research	Lead Organization	Industry	Mountain View, California
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

## Primary U.S. Work Locations

California

## Images



### Briefing Chart Image

Mobile Greenhouse Gas Flux Analyzer for Unmanned Aerial Vehicles, Phase II  
(<https://techport.nasa.gov/image/126667>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Los Gatos Research

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

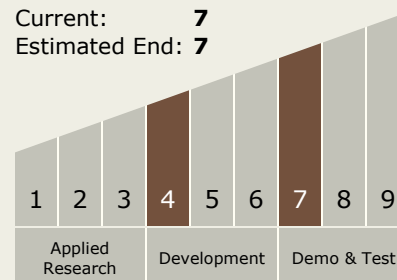
Carlos Torrez

### Principal Investigator:

Elena S Berman

## Technology Maturity (TRL)

Start: 4  
Current: 7  
Estimated End: 7



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.3 In-Situ Instruments and Sensors
    - └ TX08.3.4 Environment Sensors

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System